

Fly ash modified subgrade will be measured by the square yards (square meters) of subgrade modification completed in place.

Lime will be measured by the ton (metric ton).

Scarifying, mixing, and blading of the subgrade with lime pretreatment will be measured by the square yards (square meters) of subgrade modification completed in place.

Prime coat will be measured and paid for in accordance with Section 408.

Water will *not* be measured for payment.

317.06. BASIS OF PAYMENT.

Accepted quantities for fly-ash-modified subgrade, measured as provided above, will be paid for at the contract unit price as follows:

- (A) FLY ASH TON (METRIC TON)
- (B) SUBGRADE MODIFICATION SQUARE YARD (SQUARE METER)
- (C) LIME TON (METRIC TON)
- (D) SCARIFYING, MIXING BLADE OF SUBGRADE
WITH LIME TREATMENT SQUARE YARD (SQUARE METER)

Such payment shall be full compensation for furnishing all materials, equipment, labor, and incidentals to complete the work as specified.

SECTION 31 ECONOCRETE BASE

318.01. DESCRIPTION.

The work covered by this Section consists of the construction of an Econocrete Base in accordance with these Specifications and with the lines, grades, and dimensions shown on the Plans.

318.02. MATERIALS.

- (a) **General.** All materials shall meet the requirements specified in the following Subsections of Section 700 of the Standard Specifications for Highway Construction shown below:

Aggregate	701.15
Portland Cement	701.02
Water	701.04
Air Entraining Agent	701.03
Fly Ash	702
Chemical Admixtures	701.03
Curing Agents	701.07(d)

- (b) **Mix Design and Proportioning.** Design the mix proportions for the econocrete base, basing them on the absolute volume method for a cubic yard (cubic meter). At least 40 days prior to placement of the Econocrete Base, submit the design mix to the Engineer for approval. The design shall identify the source of materials proposed for use, the proportions of the materials,

the properties of the mixture, and the compressive strength of the mix at 28 days. In designing the mix, meet the following criteria:

- (1) The mix shall have a *minimum cement content* of 200 pounds per cubic yard (118 kg/m³). Fly ash may be substituted for up to 25 percent cement in the ratio of 1 pound (1.0 kg) of fly ash for each 1 pound (1.0 kg) of cement. Fly ash shall not be used November 1st through April 1st.
- (2) The mix shall be designed to produce a *maximum slump* of 3 inches (75 mm) at the roadway prior to placing.
- (3) The mix shall have an *air content* of four to twelve percent.
- (4) The mix shall have a *compressive strength* at 28 days of approximately 1200 psi (8300 kPa). Compressive strength shall be determined based upon results of six cylinders prepared and tested in accordance with Subsection 701.01(d).

The review and approval of the proposed mix by the Engineer will be to determine that the mix has met the design criteria.

318.03. EQUIPMENT.

All equipment used in the production and placement of the Econocrete Base shall comply with Subsection 414.03.

318.04. CONSTRUCTION METHODS.

Construction methods shall comply with the requirements of Subsection 414.04 except as noted herein. After strike off and consolidation, no additional finishing will be required except as needed to provide the required elevation, cross section, and smooth surface finish.

Place no longitudinal or transverse joints in the Econocrete Base except for construction joints, which shall be butt joints.

Accomplish the curing by applying a curing agent at the rate of one gallon (one liter) to not more than 150 square feet (3.75 m²). The curing period will be seven curing days; a curing day will be considered to be any consecutive 24-hour period during which the air temperature adjacent to the base does not fall below 40°F (4°C). Begin recording the curing days as soon as the placement of econocrete during a day's operation has reached the point where no more manipulation of the econocrete mix is being done.

No construction traffic will be allowed on the Econocrete Base-and no overlying pavement may be placed on the base-until unconfined compressive strengths of test cylinders (made during the placement of the base) all achieve 500 psi (3500 kPa), minimum. After the base strength reaches 500 psi (3500 kPa) keep construction traffic on the base to an absolute minimum-which includes not using it as a haul road. Repair any damage to the base caused by unacceptable traffic without additional charge to the Department.

At least 12 hours but not more than 48 hours prior to beginning the placement of the reinforcing steel for the overlying pavement, sweep the base clean and apply a second application of liquid membrane curing compound to the Econocrete Base. The rate of application shall be one gallon (one liter) to not more than 200 square feet (5 m²).

NOTE: After the second application of curing agent (bond breaker) has been applied, no haul traffic will be allowed on the Econocrete Base.

The tolerance for surface, width and thickness shall be in conformity with Section 301.

318.05. METHOD OF MEASUREMENT.

Econocrete Base will be measured in accordance with the requirements of Subsection 414.05.

318.06. BASIS OF PAYMENT.

The accepted quantities of Econocrete Base, measured as provided above, will be paid for at the Contract unit price as follows:

ECONOCRETE BASE SQUARE YARD (SQUARE METER)

Such payment shall be full compensation for furnishing all materials, equipment, labor, and incidentals to complete the work as specified.

SECTION 319

OPEN-GRADED BITUMINOUS BASE

319.01. DESCRIPTION.

This work shall consist of the construction of a permeable base course of aggregate and bituminous material mixed in a central plant and spread and compacted on a prepared surface in accordance with these Specifications. It shall be in reasonably close conformity with the lines, grades, thickness, and typical cross sections shown on the Plans or established by the Engineer.

319.02 . MATERIALS.

Materials shall meet the requirements specified in Section 708.

319.03. EQUIPMENT.

The equipment used for producing, heating, mixing, hauling, spreading, compacting, and finishing the bituminous base shall meet the requirements of Subsection 411.03.

319.04. CONSTRUCTION METHODS.

The construction methods shall comply with Subsection 406.04, except as follows:

- (a) **Prime Coat.** Prime Coat, if required, shall be in accordance with Section 408.
- (b) **Tolerances.** Surface, width and thickness tolerances of the base shall be in conformity with Section 301.
- (c) **Weather Limitations.** Weather limitations shall be the same as for asphalt concrete as specified in 411.04(g).
- (d) **Construction Traffic.** Construction traffic shall not be allowed on the Open Graded Bituminous Base (OGBB) until the OGBB has cooled to ambient temperature. Additional curing time may be required in some instances to facilitate compaction of the subsequent lift of paving material. Any additional time required will be determined by the Engineer. No overlying pavement shall

be placed on the base until the curing period has been completed. After completion of the curing period, construction traffic on the OGGB shall be held to a minimum; the OGGB shall not be used as a haul road, unless the Engineer has approved the Contractor's written plan. Any damages to the base as a result of the Contractor's operation shall be repaired at his expense to the satisfaction of the Engineer. The contractor shall be responsible to see that soil, mud, or other materials are not tracked or spilled on the base that would compromise its hydraulic efficiency.

- (e) **Hydraulic efficiency.** The hydraulic efficiency of any segment of the base will be measured by the flow of water through it. Approximately one quart (one liter) of water will be doused on the surface of the open-graded base. The water shall be totally absorbed into the base within 15 seconds with no water remaining on the surface. Failure to achieve this performance standard will indicate a contaminated base whose hydraulic efficiency has been severely impaired.

NOTE: Such contaminated OGGB whose hydraulic efficiency has been severely impaired shall be removed by the contractor and replaced at no cost to the Department. The extents of the replacement will be determined by the Engineer. Hauling equipment shall not be operated on the OGGB during the placement of the overlying pavement.

319.05. METHOD OF MEASUREMENT.

Open-graded bituminous base, including the aggregate, liquid asphalt, and other ingredients as specified in the job mix formula, will be measured by the ton (metric ton) of combined mixture.

Tack coat will be measured and paid for in accordance with Section 407.

319.06. BASIS OF PAYMENT.

The accepted quantities, measured as provided above, will be paid for at the Contract unit price as follows:

OPEN GRADED BITUMINOUS BASE TON (METRIC TON)

Such payment shall be full compensation for furnishing all materials, equipment, labor, and incidentals to complete the work as specified.

SECTION 3 0

OPEN-GRADED PORTLAND CEMENT CONCRETE BASE

320.01. DESCRIPTION.

This work shall consist of the construction of a permeable base course of aggregate, Portland Cement concrete, and water mixed in a central plant and spread and compacted on a prepared surface in accordance with the lines, grades, thicknesses, and typical cross section shown on the Plans or established by the Engineer.